

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method for inspecting electronic components mounted on a printed circuit board with a mounting substance, each of the components including electrical interconnects to the circuit board comprising at least one of leads[[,]] and endcaps or other interconnects, the method comprising:

imaging the components and the mounting substance on the printed circuit board to obtain 3-D and 2-D data associated with the components and material surrounding the components; and

processing the 3-D and 2-D data in combination to find the locations of the components as a function of the 3-D and 2-D data and based on at least one of identified leads, endcaps, or other attributes and component features as differentiated from at least one of the mounting substance[[,]] and the circuit board and other material on which the components are placed.

2. (original) The method as claimed in claim 1 wherein the mounting substance is solder paste.

3. (original) The method as claimed in claim 1 wherein the mounting substance is an adhesive.

4. (original) The method as claimed in claim 3 wherein the adhesive is a glue.

5. (original) The method as claimed in claim 1 wherein the leads have feet and wherein the step of processing includes the step of calculating centroids of the feet.

6. (original) The method as claimed in claim 1 wherein the leads have feet and wherein the step of processing includes the step of calculating average height of the feet.

7. (currently amended) The method as claimed in claim 1 wherein the step of processing includes calculating a percentage of pixels classified as mounting substance that are at an area of interest border to determine a potential for bridging between adjacent solder deposits, and the percentage of pixels comprises a border violation percentage ~~the step of calculating border violation percentage of the mounting substance.~~

8. (currently amended) The method as claimed in claim 1 wherein the step of processing includes utilizing both the 2-D and the 3-D data in combination to prune the circuit board from at least one of the lead and the mounting substance ~~the step of pruning the board.~~

9. (original) The method as claimed in claim 1 wherein the step of processing includes the step of pruning the leads from the mounting substance.

10. (original) The method as claimed in claim 1 wherein the step of processing includes the step of processing the 3-D data together with upper and lower threshold values to find the locations of the leads and the mounting substance.

11. (currently amended) A system for inspecting electronic components mounted on a printed circuit board with a mounting substance, each of the components including electrical interconnects comprising at least one of leads[[,]] and endcaps ~~or other interconnects~~, the system comprising:

a 3-D scanner for imaging the components and the mounting substance on the printed circuit board to obtain 3-D and 2-D data associated with the components and material surrounding the components; and

a high-speed image processor for processing the 2-D data and the 3-D data together in combination to locate and measure the components as a function of the 3-D and

2-D data as differentiated from at least one of the mounting substance and the circuit board to find the locations of the leads and the mounting substance and for processing the 2-D data together with the locations of the leads and the mounting substance to distinguish the leads from the mounting substance.

12. (original) The system as claimed in claim 11 wherein the mounting substance is solder paste.

13. (original) The system as claimed in claim 11 wherein the mounting substance is an adhesive.

14. (original) The system as claimed in claim 13 wherein the adhesive is a glue.

15. (original) The system as claimed in claim 11 wherein the leads have feet and wherein the high speed image processor also calculates centroids of the feet.

16. (original) The system as claimed in claim 11 wherein the leads have feet and wherein the high speed image processor also calculates average height of the feet.

17. (currently amended) The system as claimed in claim 11 wherein the high speed image processor also calculates a percentage of pixels classified as mounting substance that are at an area of interest border to determine a potential for bridging between adjacent solder deposits, and the percentage of pixels comprises a border violation percentage border violation percentage of the mounting substance.

18. (currently amended) The system as claimed in claim 11 wherein the high speed image processor utilizes both the 2-D and the 3-D data in combination to prune the circuit board from at least one of the lead and the mounting substance also prunes the board.

19. (original) The system as claimed in claim 11 wherein the high speed image processor also prunes the leads from the mounting substance.

20. (original) The system as claimed in claim 11 wherein the high speed image processor processes the 3-D data with the upper and lower threshold values to find the locations of the leads and the mounting substance.

21. (currently amended) A method for inspecting electronic components mounted on a printed circuit board with a mounting substance, each of the components including a body and endcaps, the method comprising:

A2 imaging the components and material surrounding the components to obtain 3-D and 2-D data;

processing the 2-D and 3-D data in combination to find locations of the endcaps as a function of the 2-D and 3-D data; and

further processing ~~with~~ using the 2-D data to isolate the endcaps from their bodies.

22. (new) The method of claim 1 wherein the step of processing comprises forming a blob image using at least one of the 2-D and 3-D data, and masking the at least one of the 2-D and 3-D data with the blob image.

23. (new) The method of claim 22 wherein the step of forming comprises applying at least one threshold to the at least one of the 2-D and 3-D data.

24. (new) The method of claim 22 further comprising detecting an edge of the blob image and applying a bounding rectangle to the edge.

25. (new) The method of claim 24 wherein the bounding rectangle is a minimum area rectangle, and wherein the bounding rectangle is used to determine component position and orientation.

26. (new) The method of claim 1 wherein the step of processing comprises comparing at least one of a predetermined three-dimensional size and shape of a component with 3-D data representative of the component so as to verify component presence.

A2 27. (new) The method of claim 1 wherein the step of processing comprises comparing at least one of a predetermined three-dimensional size and shape of an attribute of the component with 3-D data representative of the attribute to verify component presence.

28. (new) The system of claim 11 wherein the high-speed image processor also (a) forms a blob image from at least one of the 2-D and 3-D data; and (b) masks at least one of the 2-D and 3-D data with the blob image.
